

semitransparent. The *mantle* adheres to the sides of the siphon, so that the *mantle-opening*, which is single in all other known Cephalopods, is here divided into two pocket-like openings, which lie one beneath each eye. The *siphon* is very long and narrow, and extends forwards anteriorly to the margin of the mantle, for a distance almost equal to the length of the body, and is a little swollen at the extremity.

The *Head* is undistinguishable from the body except by the possession of the *eyes*, which are situated near together on the dorsal surface; they consist of a larger basal spheroid, through the walls of which pigment is clearly visible, upon which stands a smaller, very prominent spheroid, white, opaque, and of glistening surface.

The *Arms* are equal and rather more than twice as long as the body; they are slender, and taper at first gradually and then more rapidly to comparatively blunt points. The *umbrella* extends more than two thirds up the arms, and is thin, delicate, transparent, and much damaged. The *suckers* are firm, muscular cups embedded in the softer tissue of the arms, as in *Cirroteuthis*; there are about twelve placed at some distance apart on that portion of the arm up which the web extends, and eleven closely set and showing a tendency to biserial arrangement on the free extremities. There are no *cirri* nor is there any trace of the formation of a *hectocotylus*.

The *Surface* appears to have been quite smooth originally; there is no sign of any *cirri* or warts.

The *Colour* is a dull yellow, apparently due to preservation in picric acid, and the mantle and umbrella are thickly sprinkled with small brown chromatophores.

Hab. Near the Kermadec Islands, South Pacific; on the surface (Station 171). One specimen, sex?

XX.—*Note on the Structure of the Skeleton in the Anomocladina.* By Prof. SOLLAS, D.Sc., F.G.S.

As considerable difficulty appears to exist with regard to the constitution of the skeleton of the Anomocladina it may be useful to publish at once a short account of the results of some observations which appear to remove all doubt. Full particulars, with illustrations, will appear in my paper on *Vetulina*, now in the hands of the Royal Irish Academy.

The Anomocladina, one of the four families of Lithistid

Sponges established by Zittel*, were originally defined by him as distinguished by their "unregelmässig ästige Skeletkörperchen deren Aeste in einem knotig verdickten Centrum zusammenstossen. Da dieselben an ihren Enden nur mässig verzweigt sind, so entsteht ein maschiges Netzwerk, das in manchen Fällen grosse Aehnlichkeit mit dem Gittergerüst gewisser Hexactinelliden erhält," &c.

Oscar Schmidt† subsequently described an existing representative of this group, previously only known in a fossil state, and confirmed and extended Zittel's observations. He recognized the branched corpuscles and two kinds of nodes in the network which they form by their union, one kind provided by the centrum of the corpuscle, the other formed by the union of the ends of its rays with those of adjoining corpuscles.

Quite recently Zittel‡, being unable to find more than one kind of node in the network, and that formed by a union of the ends of the rods, concludes that he was mistaken in supposing that the corpuscles consisted of a centrum and radiating arms, and proposes an amended definition of the *Anomocladina*, as follows:—"Skeletal elements consisting of simple, generally straight, but sometimes curved rods, more or less strongly branched at the two extremities. The branched ends of several (4-9) neighbouring rods meet together, and by their amalgamation form the nodes."

By the method which I find most successful in studying Lithistid skeletons (boiling in caustic potash) it is easy to completely isolate the corpuscles of *Vetulina*, and they are then found to exhibit the characters which Zittel first assigned to the corpuscles of the *Anomocladina*, and which were subsequently seen by Schmidt. Further, by my method of cutting frozen sections § it is possible to obtain a layer of the skeletal network only one corpuscle thick (less if needful), and then one clearly perceives that there is, as a rule, but *one kind of node*, only this is not produced by the union of the ends of the corpuscular rays, but by the centrum of the corpuscles, against which the rays of neighbouring corpuscles abut. About the place of abutment the centrum throws out numerous branched spines, which, except in successful sections, make interpretation of the structure difficult. In some cases the

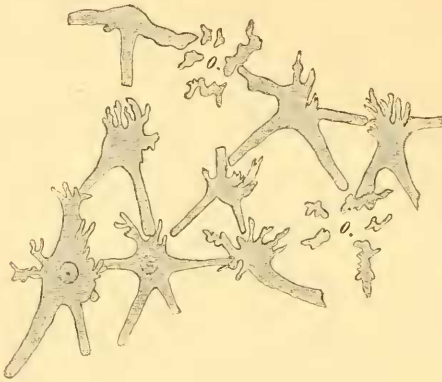
* Zittel, 'Studien über fossile Spongien,' ii. Abth., Lithistidæ, 1878, p. 23.

† O. Schmidt, 'Die Spongien des Meerbusen von Mexico,' 1879, p. 29.

‡ Zittel, "Ueber Astylospongidae und Anomocladina," JB. Mineral. 1884, ii. p. 75. Translated by W. S. Dallas, 'Annals' (5), xiv. p. 271.

§ Sollas, "An Improvement in the Method of Using the Freezing Microtome," Quart. Journ. Micr. Sci. n. s. xxiv. p. 163.

centrum gives off rays on one side only and on the other side receives rays only. It then, when isolated, much resembles the stellates of *Holasterella*, Carter.



The accompanying rough sketch, made by camera lucida, illustrates this mode of union. In some parts of the section, marked *o*, the razor has cut away the centrum of a corpusele, leaving, however, the spines, which thus remain to indicate its position. As the specimen from which the section was taken had been boiled in caustic potash, the rays of the corpuseles shown in the figure are not so long as in untreated specimens; in my extended paper careful drawings will show the rays complete up to their natural terminations.

XXI.—*Lepidoptera* collected by Mr. C. M. Woodford in the *Ellice and Gilbert Islands*. By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

THE species here enumerated were obtained in Nukufetua (Ellice group), and Tarawa and Tapetwea (Gilbert group). They are chiefly interesting as adding to our knowledge of the fauna of these islands.

RHOPALOCERA.

Nymphalidæ.

1. *Junonia villida*.

Papilio villida, Fabricius, Mant. Ins. ii. p. 35. n. 366 (1787); Donovan, Ins. New Holl. pl. 25. fig. 3 (1805).

♂. Nukufetua and Tapetwea.